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**Lee**

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(54) **ELECTRONIC APPARATUS HAVING HINGE ASSEMBLIES WITH COVER UNITS**

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See application file for complete search history.

(56) **References Cited**

**U.S. PATENT DOCUMENTS**

1,167,906	A *	1/1916	Le Compte	296/92
2,206,739	A *	7/1940	Brogren et al.	16/354
4,056,985	A *	11/1977	Worrallo	74/435
4,765,027	A *	8/1988	Andric	16/354
5,966,777	A *	10/1999	Jantschek	16/354
5,987,704	A *	11/1999	Tang	16/354
5,991,975	A *	11/1999	Baer	16/354
6,223,393	B1	5/2001	Knopf	

(Continued)

**FOREIGN PATENT DOCUMENTS**

JP	2008-228249	9/2008
JP	2009-225193	10/2009

(Continued)

**OTHER PUBLICATIONS**

Extended European Search Report mailed May 20, 2015 in corresponding European Application No. 14179005.5-1959.

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(57)

**ABSTRACT**

An electronic apparatus includes first and second device units, at least one hinge assembly configured to pivotally connect the second device unit to the first device unit and including a plurality of shaft members, and a plurality of cover units mounted on the at least one hinge assembly to hide the at least one hinge assembly. Each of the cover units includes a first cover member to hide a first side of the at least one hinge assembly and a second cover member to hide a second side of the at least one hinge assembly, a second cover member of each of the cover units is partially overlapped with an adjacent second cover member while the first and second device unit are folded, and a relative position of second cover members is changed according to an angle at which the first and second device units are unfolded.

**19 Claims, 21 Drawing Sheets**

